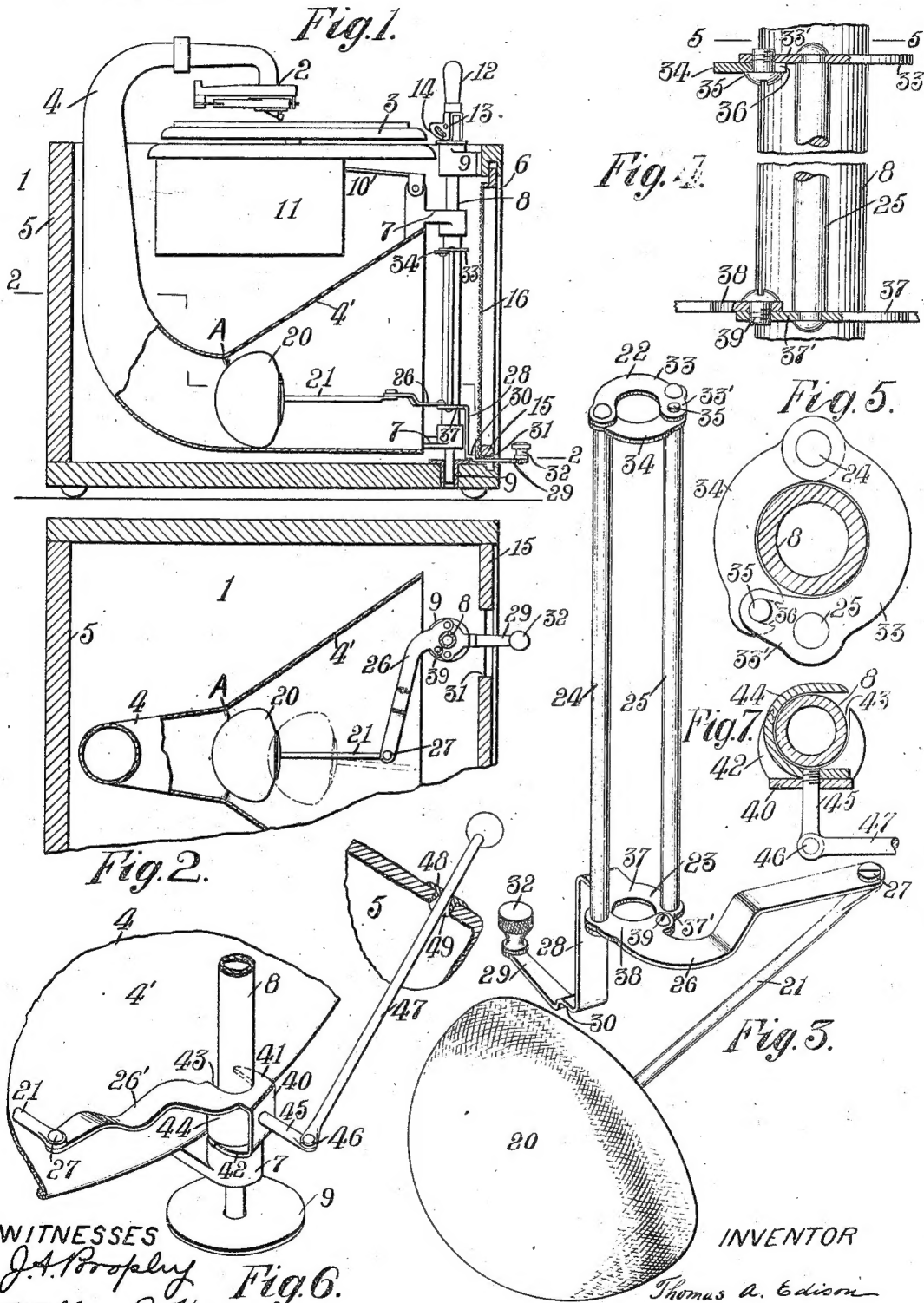


T. A. EDISON.
SOUND MODIFYING DEVICE.
APPLICATION FILED APR. 25, 1914.

1,201,449.

Patented Oct. 17, 1916.



WITNESSES

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SOUND-MODIFYING DEVICE.

1,201,449.

Specification of Letters Patent.

Patented Oct. 17, 1916.

Application filed April 25, 1914. Serial No. 834,300.

To all whom it may concern:

Be it known that I, THOMAS A. EDISON, a citizen of the United States, and a resident of Llewellyn Park, West Orange, Essex county, New Jersey, have invented certain new and useful Improvements in Sound-Modifying Devices, of which the following is a description.

My invention relates to sound modifying devices employed with or adapted for application to phonographs, being in some aspects an improvement on the invention disclosed in my Patent No. 1,110,382, dated September 15, 1914, and entitled Sound modifiers.

One of the objects of my invention is to provide an improved sound modifying device of simple construction which shall be cheap to manufacture and efficient in operation, and which embodies improved means for controlling and effecting the adjustment of the modifier within the sound conveyer of a phonograph to regulate the volume of sound.

Another object of my invention is to provide a device of this character in the form of an attachment capable of being readily applied to phonographs in use.

Other features of my invention reside in the construction of parts and combinations of elements hereinafter more fully described and claimed.

For a clearer understanding of my invention, attention is directed to the accompanying drawing forming a part of this specification and in which—

Figure 1 is a side elevational view, partly in section, of a phonograph equipped with my invention; Fig. 2 is a horizontal sectional view taken approximately on line 2—2 of Fig. 1, parts being shown in full; Fig. 3 is an enlarged view in perspective of the modifying device shown in Figs. 1 and 2; Fig. 4 is an enlarged elevational view, partly in section, of a portion of the rod supporting the amplifier of the phonograph illustrated in Figs. 1 and 2 and showing the connection of the modifying device therewith; Fig. 5 is a sectional view taken on line 5—5 of Fig. 4; Fig. 6 is a fragmental

view in perspective showing a somewhat modified form of my invention applied to a phonograph; and Fig. 7 is a detailed part sectional view of the structure shown in Fig. 6.

In all the views of the drawing, like parts are designated by the same reference characters.

Referring now to the drawing and especially to Figs. 1 and 2, reference character 1 represents a phonograph of the inclosed horn type, the reproducer 2 thereof being connected to and supported for movement across the record table or support 3 by the sound conveyer or amplifier 4, the latter extending rearwardly from the reproducer, thence downwardly into the cabinet or casing 5, and thence forwardly toward the front of the casing. The large horizontally extending exit portion 4' of the amplifier terminates in the rear of the front of the casing adjacent an opening 6 therein, and preferably flares outwardly in an abrupt manner from a section A, hereinafter referred to as the "throat" of the amplifier.

The amplifier is suitably secured adjacent its exit, as by means of brackets 7, to a vertical rod 8 pivotally mounted in alined bearings 9 secured to the cabinet 5. Reference character 10 designates an arm secured at one end to the upper bracket 7 and provided at its other end with a rack (not shown) adapted to engage with and be driven by a gear of the motor, indicated generally at 11, so as to swing the amplifier about rod 8 and thus feed the reproducer 2 across a record on the support 3. The rod 8 has a portion extending above the upper bearing 9 and a member 12 is pivotally secured at 13 to such portion. Below the pivot 13, the member 12 is provided with a cam 14 engaging the upper surface of the upper bearing 9 whereby the latter serves to support the amplifier and the parts connected therewith. It will be evident that the turning of member 12 about pivot 13 effects, by reason of the coaction of cam 14 and the upper bearing 9, longitudinal movement of rod 8 in bearings 9, and in consequence the lowering or raising of the am-

plifier 4 to thereby move the stylus of reproducer 2 into and out of operative position with respect to a record on the support 3, and the rack of arm 10 into and out of engagement with its driving gear. A frame 15 is removably mounted in the opening 6 and has secured thereto a covering 16 of fabric or like material whereby the mechanism within the cabinet will be concealed and the appearance of the machine improved.

The construction above described is in general that usually employed in disk phonographs of the Edison type and is similar to that disclosed and claimed in my application, Serial No. 609,100, filed February 17, 1911, and entitled Talking machines.

My improved modifying device comprises in general a modifier 20 disposed in the flaring exit portion 4' of the sound conveyer or amplifier 4 and a device loosely mounted on rod 8 and so connected with the modifier that pivotal movement of the device on rod 8 will effect the adjustment of the modifier longitudinally of the amplifier. The modifier 20 is preferably of a size and shape to completely fill the sound conveyer when located at the "throat" A and preferably consists of a mass of loosely packed cellular or fibrous material, such as cotton waste, horse hair, asbestos or cloth inclosed in a casing of felt or cloth whereby the sound waves or vibrations will pass therethrough without deflection although their amplitude or intensity will be reduced. It will be apparent that the proportion of the total number of sound waves which are caused to pass through the modifier and consequently the degree of modification in the volume of the sound depends upon the location of the modifier within the amplifier.

The modifier engages and is supported by the lower wall of the exit portion 4' of the amplifier and has secured thereto substantially centrally thereof a forwardly extending rod 21.

In the form of my invention shown in Figs. 1 to 5, the device for effecting and controlling the adjustment of the modifier comprises a pair of spaced aligned bearings 22 and 23, in the form of sleeves or rings, loosely mounted on rod 8 between the brackets 7 and respectively secured to the opposite ends of a pair of parallel rods 24 and 25. The upper and lower ends of rods 24 and 25 are respectively secured to the bearings or rings 22 and 23 at diametrically opposite points. The lower bearing 23 is provided with a substantially horizontal arm 26, the free end of which is pivotally connected at 27 to the outer end of rod 21. This bearing is also provided with a member preferably consisting of a vertical portion 28 depending from the bearing and a

horizontal arm or portion 29 connected by a step portion 30 to the lower end of the portion 28. The step portion 30 engages the lower bearing 9 for rod 8 and serves to support the bearings 22 and 23 and the parts connected therewith. The length of portion 28 is such that the bearings 22 and 23 will be supported on rod 8 in the position shown in Fig. 1 with arm 26 and rod 21 substantially horizontal whereby there will be no tendency of the bearings to bind on rod 8 and the device may be easily manipulated to adjust the modifier. The arm 29 extends to the exterior of the cabinet 5 through a horizontal slot 31 provided in the lower part of the frame 15 and this arm is provided at its outer end with a button 32 screwed thereto and serving as a handle. The arm 29 is short as compared with arm 26 and the latter, although extending from bearing 22 at a point diametrically opposite the arm 29, is provided adjacent the bearing with a sharp bend whereby the greater portion thereof is substantially at right angles to the arm 29. Accordingly, a slight movement of arm 29 about rod 8 independently of the amplifier will result in a considerably greater movement of the end of arm 26 in an arc substantially tangent to the longitudinal center line of the amplifier and thereby through rod 21 effect an amplified movement of the modifier 20 longitudinally of the amplifier 4 toward the "throat" A or the exit thereof according to the direction in which the handle 32 is moved. In moving toward the "throat" A, the modifier is directed and guided by the walls of the amplifier. The friction between the modifier 20 and the walls of the amplifier is sufficient to overcome the slight friction between the step portion 30 and bearing 9. Accordingly, as the amplifier swings about the axis of rod 8, the entire modifying device will also swing therewith about the said axis and the position of the modifier within the amplifier will remain unchanged, whereby it is assured that, after the modifying device has once been adjusted, there will be no variation in the modification of the reproduction until further adjustment by the operator or user.

In order that the modifying device above described may be readily applied to phonographs in use, I preferably make each of the bearings 22 and 23 in the form of a two-part ring or sleeve, the two parts of each ring being hingedly connected at one end and detachably connected at the other end. As shown, the upper bearing 22 is composed of two segments 33 and 34 loosely but permanently mounted at one end on a reduced portion of rod 24. The segment 33 is suitably secured to the rod 25 and is considerably longer than segment 34, the end portion 33'

thereof being detachably secured to the free end of segment 34 as by a screw 35. The screw 35 is threaded into segment 33 and the free end of segment 34 is provided with a notch or recess 36 in which the shank of the screw is disposed. The lower bearing 23 is likewise composed of two segments 37 and 38 loosely but permanently mounted at one end on a reduced portion of rod 24. The segment 37 is secured to rod 25 and is longer than segment 38, the end portion 37' thereof being detachably secured to the free end of segment 38 as by a screw 39 engaging a hole in each segment. The member consisting of portions 28 and 30 and arm 29 is secured to and preferably formed integral with segment 37 and the arm 26 is secured to and preferably formed integral with segment 38. It will be apparent that by reason of the construction just described, the bearings 22 and 23 and the parts carried thereby may be readily mounted on the rod 8. The only change necessary in applying the entire modifying device to the phonograph is to provide the front of the casing 5 with the slot 31 for the arm 29.

In the modified form of my invention shown in Figs. 6 and 7, the device loosely mounted on rod 8 comprises a short vertical member 40 having at its ends a pair of horizontal projections or flanges 41 and 42. The flanges 41 and 42 constitute bearings and are provided with alined U-shaped notches or recesses 43 in which rod 8 is disposed. The upper flange 41 is provided with an arm 26', the free end of which is connected by the pivot 27 to the rod 21 attached to the modifier. The parts 41, 42, 43 and 26' may be conveniently formed, as by stamping, from a single piece of sheet metal. The lower flange or bearing 42 rests on the lower bracket 7 and serves to support the member 40 and the parts carried thereby. The upper flange or bearing 42 is spaced from the lower bearing 41 a distance sufficient to maintain the arm 26' and rod 21 substantially horizontal. In order to prevent rod 8 from slipping out of the notches 43 in flanges 41 and 42, I provide between the latter a U-shaped member or "keeper" 44. As shown in Fig. 7, the legs of the U-shaped member 44 are substantially at right angles to the U-shaped notches 43. A rod 45, considerably shorter than the arm 26', extends from member 40 substantially at right angles to said arm. Arm 26' and rod 45 correspond to arms 26 and 28 of the device shown in Figs. 1 to 5. The inner end of rod 45 is threaded into members 40 and 44 and serves to secure the said members firmly together in the position shown in Fig. 7. The outer end of rod 45 is connected by a pivot 46 to a rod 47 which extends transversely of the cabinet 5 and to the exterior thereof through a bearing 48 se-

cured in one of the side walls of the cabinet. A slight longitudinal movement of rod 47 will move rod 45 about rod 8 and thereby effect an amplified movement of the modifier 20 longitudinally of the conveyer in one direction or the other as described above in connection with the construction shown in Figs. 1 to 3. The entire modifying device will also swing with the amplifier about the axis of rod 8 so that the modifier will remain in any adjusted position in the amplifier until further manipulation of the rod 47 by the operator. In applying the device shown in Figs. 6 and 7 to the phonograph, the only alteration necessary is the provision of the bearing 48 in one side of the cabinet or casing 5. The manner of mounting the member 40 and the parts associated therewith on rod 8 is believed to be obvious.

It is to be understood that many changes may be made in the size, shape and arrangement of the parts of the specific embodiments shown and described herein without any departure from the spirit or scope of the invention.

Having now described my invention, what I claim as new and desire to protect by Letters Patent of the United States is as follows:

1. In a phonograph, a sound amplifier mounted for swinging movement about a fixed axis, a sound modifier within said amplifier, and means connected with said modifier for adjusting the same in said amplifier, said means and modifier being mounted to swing with the amplifier about said axis, and said means being turnable about said axis independently of said amplifier to effect the adjustment of the modifier in the amplifier, substantially as described.

2. In a phonograph, the combination of a vertical member, a sound amplifier connected to said member for swinging movement about the axis thereof, a sound modifier mounted within said amplifier for movement longitudinally thereof, and means for effecting such movement of the modifier comprising an arm loosely mounted for turning movement on said member and a rod secured to the modifier and having a pivotal connection with said arm, substantially as described.

3. In a phonograph, the combination with the cabinet thereof, of an amplifier in said cabinet, a vertical rod adjacent the exit of the amplifier, said amplifier being connected with said rod for swinging movement about the axis thereof, a sound modifier within said amplifier, and means for adjusting said modifier comprising a device loosely mounted on said rod and operatively connected with the modifier, said device being provided with an operating member extending to the exterior of the cabinet, substantially as described.

4. In a phonograph, the combination with the cabinet thereof, of an amplifier mounted in said cabinet for swinging movement about a substantially vertical axis adjacent its exit, a sound modifier within said amplifier, and means for adjusting the modifier longitudinally of the amplifier comprising a device mounted for pivotal movement about said axis, a rod connected to the modifier and having a pivotal connection with said device, and an operating member connected to said device and extending to the exterior of the cabinet, substantially as described.

5. In a phonograph, the combination of a vertical rod, a sound amplifier mounted on said rod for swinging movement about the axis thereof, a sound modifier located within and supported by said amplifier, and means for adjusting the modifier longitudinally of the amplifier comprising a member connected to the modifier and a device loosely mounted on said rod for pivotal movement and operatively connected to said member, pivotal movement of said device independently of the amplifier positively effecting through said member movement of the modifier longitudinally of said amplifier, substantially as described.

6. An attachment for phonographs comprising a modifier, and actuating means therefor comprising a device having a pair of spaced alined bearings adapted to be mounted for pivotal movement about a fixed axis and a connection between one of said bearings and the modifier, substantially as described.

7. A sound modifying attachment comprising a sound modifier, a pair of bearings, means securing said bearings together in spaced relation, each of said bearings comprising two parts hingedly connected at one end and detachably connected at the other end, one of said bearings having an extension, and a rod pivotally connected at one end to said extension and secured at its other end to the modifier, substantially as described.

8. A sound modifying attachment comprising a sound modifier, a device consisting of a pair of spaced alined bearings adapted to be mounted for pivotal movement about a fixed axis, said device having a pair of arms extending substantially at right angles to the axis of said bearings, and a rod connected to said modifier and having a pivotal connection with one of said arms, substantially as described.

9. A sound modifying attachment comprising a sound modifier, operating means therefor comprising a bearing ring or sleeve, said ring or sleeve consisting of two parts hingedly connected at one end and detachably secured together at the other end, one of said parts being provided with an actuating

member, and the other of said parts being operatively connected with said modifier, substantially as described.

10. In a phonograph, a sound amplifier mounted for swinging movement about a fixed axis, a sound modifier within said amplifier, and means connected with said modifier for adjusting the same longitudinally of said amplifier, said means and modifier being mounted to partake of the swinging movement of the amplifier, and said means being pivotally movable independently of said amplifier to effect the adjustment of the modifier longitudinally of the amplifier, substantially as described.

11. In a phonograph, the combination of a vertical member, a sound amplifier connected to said member for swinging movement about the axis thereof, a sound modifier mounted within said amplifier for movement longitudinally thereof, and means for effecting such movement of the modifier, comprising a pivotally mounted arm and a rod secured to the modifier and having a pivotal connection with said arm, substantially as described.

12. In a phonograph, the combination of an amplifier mounted for swinging movement about a substantially vertical axis, a sound modifier within said amplifier, and means for adjusting said modifier longitudinally of the amplifier, comprising a device operatively connected with said modifier and pivotally movable to effect such adjustment of the modifier, substantially as described.

13. In a phonograph, the combination with a cabinet, of an amplifier in said cabinet, a vertical rod adjacent the exit of the amplifier, said amplifier being connected with said rod for swinging movement about the axis thereof, a sound modifier within said amplifier, and means for adjusting said modifier longitudinally of the amplifier comprising a device operatively connected with the modifier and pivotally movable to effect such adjustment of the modifier, substantially as described.

14. In a phonograph, the combination of an amplifier mounted for swinging movement about a substantially vertical axis, a sound modifier within said amplifier, and means for adjusting the modifier longitudinally of the amplifier, comprising a device mounted for pivotal movement and a rod connected to the modifier and having a pivotal connection with said device, substantially as described.

15. In a phonograph, a sound amplifier mounted for swinging movement about a substantially vertical axis, a sound modifier located within and supported by said amplifier, and means for adjusting the modifier longitudinally of the amplifier, comprising a member connected to the modifier and a piv-

otally mounted device operatively connected
to said member, pivotal movement of said
device independently of the amplifier posi-
tively effecting, through said member, move-
5 ment of the modifier longitudinally of said
amplifier, substantially as described.

This specification signed and witnessed
this 21st day of April, 1914.

THOS. A. EDISON.

Witnesses:

WILLIAM A. HARDY,

MARY J. LAIDLAW.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."